**IN THE UNITED STATES PATENT AND TRADEMARK OFFICE**

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| In re Application of: | : | |
| | : | Group Art Unit: 2825 |
| Herman Kwong | : | |
| | : | Examiner: Yelena Rossoshek |
| Appln. No.: 10/728,894 | : | |
| | : | Confirmation No.: 9607 |
| Filed: December 8, 2003 | : | |
| | : | Customer No.: 21967 |
| For: CONTACT MAPPING USING CHANNEL ROUTING | : | |

Mail Stop Amendment
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

**AMENDMENT/RESPONSE**

Sir:

In response to the Office Action dated June 5, 2006, please amend the above-identified patent application as follows:

**IN THE CLAIMS:**

Please amend claims 1, 10, and 15 as indicated in attached Appendix A.

A listing of the status of all claims 1-18 in the present patent application is provided in attached Appendix A.

**REMARKS**

The Office Action dated June 5, 2006, has been received and carefully considered. In this response, claims 1, 10, and 15 have been amended. Entry of the amendments to claims 1, 10, and 15 is respectfully requested. Reconsideration of the outstanding rejections in the present application is also respectfully requested based on the following remarks.

I. THE ELECTION/RESTRICTION REQUIREMENT

On pages 1-2 of the Office Action, the Examiner asserts that the election/restriction requirement is deemed proper and thus made final since claims 1-9 and claims 10-14 are related as combination and subcombination. However, as stated in the prior response, under 35 U.S.C. § 121, restriction is appropriate if two or more independent and distinct inventions are claimed in one application. As set forth in MPEP § 802.01, inventions are independent if there is no disclosed relationship between the two or more subjects disclosed, and inventions are distinct if two or more subjects as disclosed are capable of separate manufacture, use, or sale as claimed. The Examiner apparently attempts to explain how the invention defined in claims 1-9 is distinct from the invention defined in claims 10-14. However, the Examiner fails to explain how the invention defined in

claims 1-9 is independent from the invention defined in claims 10-14. That is, it is clear that the invention defined in claims 1-9 and the invention defined in claims 10-14 are both directed to a method for mapping contacts of a programmable logic device (PLD) to an electronic component in a signal routing device having one or more layers (see preambles). Indeed, claims 4-5 recite substantially the same elements as those of claim 10, so the search for one group would not be different for the other group, as the Examiner suggests. Thus, the invention defined in claims 1-9 and the invention defined in claims 10-14 are clearly related and are not independent from each other. Accordingly, it is respectfully submitted that the election/restriction requirement is improper, and the withdrawal of such election/restriction requirement is respectfully requested.

At this point it should be noted that claim 10 has been amended to broaden the preamble and similar to the amendments to claim 1 as discussed below.

## II. THE ANTICIPATION REJECTION OF CLAIMS 1-9 AND 15-18

On pages 3-8 of the Office Action, claims 1-9 and 15-18 were rejected under 35 U.S.C. § 102(e) as being anticipated by

Taylor (U.S. Patent No. 5,857,109). This rejection is hereby respectfully traversed.

Under 35 U.S.C. § 102, the Patent Office bears the burden of presenting at least a prima facie case of anticipation. In re Sun, 31 USPQ2d 1451, 1453 (Fed. Cir. 1993) (unpublished). Anticipation requires that a prior art reference disclose, either expressly or under the principles of inherency, each and every element of the claimed invention. Id.. "In addition, the prior art reference must be enabling." Akzo N.V. v. U.S. International Trade Commission, 808 F.2d 1471, 1479, 1 USPQ2d 1241, 1245 (Fed. Cir. 1986), cert. denied, 482 U.S. 909 (1987). That is, the prior art reference must sufficiently describe the claimed invention so as to have placed the public in possession of it. In re Donohue, 766 F.2d 531, 533, 226 USPQ 619, 621 (Fed. Cir. 1985). Such possession is effected only if one of ordinary skill in the art could have combined the disclosure in the prior art reference with his/her own knowledge to make the claimed invention. Id..

Regarding claim 1, the Examiner asserts that Taylor teaches the claimed invention by generally teaching that a programmable logic device (PLD), such as a field programmable gate array (FPGA), may be reconfigured, and that its busses may be configured into an arbitrary number of bus channels. Applicants

respectfully disagree. Specifically, Taylor fails to teach, or even suggest, any type of method for mapping contacts of a programmable logic device (PLD) to an electronic component in a signal routing device having one or more layers. To clarify this shortcoming of Taylor, Applicants have amended claim 1 to recite that the one or more channels are formed by arranging vias for contacts of at least the electronic component in the signal routing device. Taylor certainly fails to teach, or even suggest, this added limitation, in addition to the original limitations of claim 1. At this point it should be noted that, as stated in MPEP § 2131, "A claim is anticipated only if each and every element as set forth in the claim is found, either expressly or inherently described, in a single prior art reference." Verdegaal Bros. v. Union Oil Co. of California, 2 USPQ2d 1051, 1053 (Fed. Cir. 1987). Also, as stated in MPEP § 2112, "In relying upon the theory of inherency, the examiner must provide a basis in fact and/or technical reasoning to reasonably support the determination that the allegedly inherent characteristic necessarily flows from the teachings of the applied prior art." Ex parte Levy, 17 USPQ2d 1461, 1464 (Bd. Pat. App. & Inter. 1990) (emphasis in original). The fact that a certain result or characteristic may occur or be present in the prior art is not sufficient to establish the inherency of

that result or characteristic. In re Rijckaert, 9 F.3d 1531, 1534, 28 USPQ2d 1955, 1957 (Fed. Cir. 1993).

In view of the foregoing, it is respectfully submitted that Taylor fails to teach, or even suggest, the claimed invention as set forth in claim 1. Thus, is it further respectfully submitted that claim 1 is allowable over Taylor.

Regarding claims 2-9, these claims are dependent upon independent claim 1. Thus, since independent claim 1 should be allowable as discussed above, claims 2-9 should also be allowable at least by virtue of their dependency on independent claim 1. Moreover, these claims recite additional features which are not disclosed, or even suggested, by the cited references taken either alone or in combination.

Regarding claim 15, this claims recite subject matter related to claim 1. Thus, the arguments set forth above with respect to claim 1 are equally applicable to claim 15. Also, claim 15 has been amended in a manner similar to claim 1. Accordingly, is it respectfully submitted that claim 15 is allowable over Taylor for the same reasons as set forth above with respect to claim 1.

Regarding claims 16-18, these claims are dependent upon independent claim 15. Thus, since independent claim 15 should be allowable as discussed above, claims 16-18 should also be

allowable at least by virtue of their dependency on independent claim 15. Moreover, these claims recite additional features which are not disclosed, or even suggested, by the cited references taken either alone or in combination.

In view of the foregoing, it is respectfully requested that the aforementioned anticipation rejection of claims 1-9 and 15-18 be withdrawn.

## III. CONCLUSION

In view of the foregoing, it is respectfully submitted that the present application is in condition for allowance, and an early indication of the same is courteously solicited. The Examiner is respectfully requested to contact the undersigned by telephone at the below listed telephone number, in order to expedite resolution of any issues and to expedite passage of the present application to issue, if any comments, questions, or suggestions arise in connection with the present application.

To the extent necessary, a petition for an extension of time under 37 CFR § 1.136 is hereby made.

Please charge any shortage in fees due in connection with the filing of this paper, including extension of time fees, to Deposit Account No. 50-0206, and please credit any excess fees to the same deposit account.

U.S. Patent Application No.: 10/728,894
Attorney Docket No.: 57983.000155
Client Reference No.: 16117ROUS02I

Respectfully submitted,

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**APPENDIX A**

1 (Currently Amended). A method for mapping contacts of a programmable logic device (PLD) to contacts of an electronic component in a signal routing device having one or more layers, the method comprising:

assigning a set of one or more contacts of the PLD to one or more respective contacts of the electronic component based at least in part on a pattern of electrically conductive traces routed from respective contacts of the electronic component via one or more channels formed at one or more layers of the signal routing device, the one or more channels being formed by arranging vias for contacts of at least the electronic component in the signal routing device.

2 (Original). The method as in Claim 1, further comprising the step of forming electrically conductive traces between the set of one or more contacts of the PLD and the respective contacts of the electronic component in accordance with the pattern of electrically conductive traces.

3 (Original). The method as in Claim 2, wherein one or more of the electrically conductive traces are routed to respective contacts of the PLD via one or more channels formed at one or

more layers of the signal routing device.

4 (Original). The method as in Claim 1, further comprising the steps of:

determining a first pattern of electrically conductive traces routed from respective contacts of the electronic component via at least one channel of the one or more channels;

determining a contact assignment pattern for one or more contacts of the PLD based at least in part on the first pattern of electrically conductive traces; and

refining the first pattern of electrically conductive traces based at least in part on the first contact assignment pattern to generate a second pattern of electrically conductive traces routed from the respective contacts of the electronic component via at least one of the one or more channels.

5 (Original). The method as in Claim 4, wherein the one or more contacts of the PLD are assigned to the one or more respective contacts of the electronic component based at least in part on the second pattern of electrically conductive traces.

6 (Original). The method as in Claim 1, further comprising the step of:

assigning one or more contacts of the PLD to one or more respective contacts of a second electronic component of the signal routing device based at least in part on a pattern of electrically conductive traces routed from respective contacts of the second electronic component via one or more channels formed at one or more layers of the signal routing device.

7 (Original). The method as in Claim 1, further comprising the step of:

assigning one or more contacts of a second PLD to one or more respective contacts of the electronic component based at least in part on a second pattern of electrically conductive traces routed from respective contacts of the electronic component via one or more channels formed at one or more layers of the signal routing device.

8 (Original). The method as in Claim 1, wherein the one or more contacts of the PLD are assigned to the respective contacts of the electronic component by programming the PLD.

9 (Original). The method as in Claim 1, wherein the electronic component includes one of a group consisting of: a programmable logic device (PLD) and an application specific integrated

circuit (ASIC).

10 (Currently Amended). A method for ~~optimizing a~~ mapping ~~of~~ contacts of a programmable logic device (PLD) to contacts of an electronic component in a signal routing device having one or more layers, the method comprising:

determining a first pattern of electrically conductive traces routed from respective contacts of the electronic component via one or more channels formed at one or more layers of the signal routing device;

determining a first contact assignment pattern for one or more contacts of the PLD based at least in part on the first pattern of electrically conductive traces;

refining the first pattern of electrically conductive traces based at least in part on the first contact assignment pattern to generate a second pattern of electrically conductive traces routed from the respective contacts of the electronic component via one or more channels formed at one or more layers of the signal routing device; and

determining a second contact assignment pattern for one or more contacts of the PLD based at least in part on the second pattern of electrically conductive traces;

wherein the one or more channels are formed by arranging

vias for contacts of at least the electronic component in the signal routing device.

11 (Original). The method as in Claim 10, further comprising the step of programming the PLD to assign contacts based at least in part on the second contact assignment pattern.

12 (Original). The method as in Claim 10, further comprising the steps of:

refining the second pattern of electrically conductive traces based at least in part on the second contact assignment pattern to generate a third pattern of electrically conductive traces routed from the respective contacts of the electronic component via one or more channels formed at one or more layers of the signal routing device; and

determining a third contact assignment pattern for one or more contacts of the PLD based at least in part on the third pattern of electrically conductive traces.

13 (Original). The method as in Claim 10, further comprising the step of programming the PLD based at least in part on the third contact assignment pattern.

14 (Original). The method as in Claim 10, wherein the electronic component includes one of a group consisting of: a programmable logic device and an application specific integrated circuit (ASIC).

15 (Currently Amended). A signal routing device having one or more layers and further comprising:

an electronic component having a plurality of contacts;

a programmable logic device (PLD) having a plurality of contacts; and

a plurality of electrically conductive traces connecting contacts of the PLD to respective contacts of the electronic component, the plurality of electrically conductive traces routed from the respective contacts of the electronic component via one or more channels formed at one or more layers of the signal routing device; ~~and~~

wherein the one or more contacts of the PLD are assigned based at least in part on a pattern formed by the electrically conductive traces routed from the respective contacts of the electronic component via the one or more channels, wherein the one or more channels are formed by arranging vias for contacts of at least the electronic component in the signal routing device.

16 (Original). The signal routing device as in Claim 15, wherein contacts of the PLD are assigned to the respective contacts of the electronic component by programming the PLD.

17 (Original). The signal routing device as in Claim 15, wherein the electronic component includes one of a group consisting of: a programmable logic device and an application specific integrated circuit (ASIC).

18 (Original). The signal routing device as in Claim 15, wherein the electrically conductive traces are routed to the respective contacts of the PLD via one or more channels formed at one or more layers of the signal routing device.